

dissolving hydrogen gas in ultrapure water, for the removal of fine metal particles while minimizing corrosion of a pattern such as metalization, i.e., a deposited film pattern of a conductor material. Further, it is proposed in JP 10-128253 A to clean and rinse a substrate under exposure to supersonic waves in hydrogen water which has been prepared by dissolving hydrogen gas to a concentration of 0.05 ppm or higher in ultrapure water.

91 The cleaning with ozone water subsequent to ashing as disclosed in JP 10-298589 A involves a potential problem in that a substrate may be damaged as the plasma ashing is performed with high energy, and the cleaning treatment with the ozone water is accompanied by a further potential problem in that the damage may be deteriorated. In addition, surface roughening may also occur by a cause other than the plasma ashing, and the cleaning with the ozone water has a potential problem in that damage may be spread from such surface roughening. The process disclosed in JP 9-255998 A, in which ultraviolet rays are irradiated in the presence of ozone, is intended for fine organic particles, and cannot be applied for stripping a resist. The cleaning with ozone water, which is disclosed in JP 10-41262 A, is intended to remove fine metal particles, and the effect of the ozone water depends upon the concentration of ozone contained in the ozone water. The concentration of ozone in conventional ozone water, which is available at room temperature under the surrounding atmospheric pressure, is its saturated concentration at the maximum, and therefore, this cleaning process is not considered to be effective for the removal of organic matter still remaining after dry ashing of a resist. Further, the process disclosed in JP 10-128253 A, in which a substrate is soaked in hydrogen water prepared by dissolving hydrogen gas to a concentration of 0.05 ppm or higher in ultrapure water and is exposed to ultrasonic waves, relates to rinsing treatment, and this patent publication makes no mention about the removal of a residue of a resist after dry ashing of the resist.

---